

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.116 – EXPEDITED PROCEDURE
Serial Number: 10/821,627
Filing Date: April 9, 2004
Title: ELECTRO-OPTIC MODULATOR ON RIB WAVEGUIDE

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REMARKS

This responds to the Office Action mailed on August 20, 2008.

No claims are amended, canceled, or added. Claims 25-49 are now pending in this application.

§102 Rejection of the Claims

Claims 25-29, 31-33, 36-39, 41, 43-45, and 49 were rejected under 35 U.S.C. § 102(b) for anticipation by Morse et al. (U.S. Patent No. 6,351,326 B1). This rejection is respectfully traversed, as Morse et al., lack several of the elements recited in the claims.

Claim 25 recites a p⁺ doped area and an n⁺ doped area formed on first and second sides of the optical resonant cavity such that the cavity forms an intrinsic, non-active region of a P-I-N diode. The Office Action asserts that Morse et al., at col 5, lines 26-44 describes such an arrangement. This assertion is respectfully traversed, as the cited language clearly describes that both silicon regions 117 and 118 are both either p-type doped semiconductor material or n-type doped semiconductor material. There is no description of the silicon regions of Morse et al., being differently doped from each other. Thus, Morse does not describe the same structure as claimed.

The language in claim 1 stating that “such that the optical resonant cavity forms an intrinsic, non-active region of a P-I-N diode” was indicated in the response to arguments section of the Final Office Action as being functional, and not part of the structure, citing *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997). MPEP 2114. The reliance on *In re Schreiber* is believed misguided.

In re Schreiber is cited for the proposition that claims directed to an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997). *In re Schreiber* involved the use of a conical spout for open-ended containers for dispensing popped popcorn. The court found that “...*Schreiber*’s contention that his structure will be used to dispense popcorn does not have patentable weight if the structure is already known, regardless of whether it has ever been used in

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any way in connection with popcorn.” Id. In other words, it is not a functional limitation, but rather a use limitation. The present claims are not directed to a new use for a known structure. Instead, the functions recited in the present claims serve to precisely define present structural attributes of the elements. The elements are arranged to form a P-I-N diode, an arrangement totally different than that taught in Morse et al.

Functional language is specifically authorized in MPEP § 2173.05(g): “A functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used.” Examples of acceptable limitations referenced in this MPEP section include “incapable of forming a dye with said oxidizing developing agent” because it sets definite boundaries on the patent protection sought, and “members adapted to be positioned” serves to precisely define present structural attributes of interrelated component parts.

In the present claim language, “such that the optical resonant cavity forms an intrinsic, non-active region of a P-I-N diode” in fact conveys to a person of skill in the art that the structure must be formed such that it functions as a diode. The structure of Morse et al., is incapable of functioning as a diode. The regions 117 and 118 both have the same doping, and further, since they are separated by a dielectric layer, they function as a capacitor, accumulating charge, rather than as a diode as claimed. Therefore, the function language imparts a structural difference from the prior art, and must be considered as defining the structural aspects of the claim. It is not merely the statement of intended use described in *In re Schreiber*.

Claim 26 further recites that carriers are injected into the optical resonant cavity by applying a voltage across the p+ and n+ doped areas to change the resonant frequency of the optical resonant cavity. The structure of Morse et al., is not capable of carrier injection as claimed, and in fact clearly describes that charges are accumulated in Col. 5, lines 29-36. Nowhere does Morse et al., describe carrier injection as claimed. The fact that carriers are injected in claim 26 further points to the difference in structure that allows carriers to be injected. It clearly describes the use of a diode, and not the capacitive structure of Morse et al. Thus, it is structurally very different from Morse et al., and the rejection should be withdrawn.

Independent claim 36 recites controlling the concentration of free carriers in the optical resonator cavity to vary the refractive index of the optical resonator cavity. This element is in a

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means plus function format and thus must be read to cover the structures described in the specification that accomplish the function. As can be seen in FIG. 3, the n⁺ and p⁺ areas are disposed on opposite sides of the rib waveguide 135, light propagates along the rib, between the n⁺ and p⁺ areas. The structure is a P-I-N diode, and provides for carrier injection in the waveguide. This structure is very different from that described by Morse et al., as indicated above.

Independent claim 49 is believed to distinguish from Morse et al., for at least the same reasons as claim 25, as it clearly recites a structure forming a P-I-N diode.

Each of the dependent claims are also believed allowable for at least the same reasons as the claims from which they depend.

§103 Rejection of the Claims

Claims 30, 34-35, 40, 42, and 46-48 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Morse et al. (U.S. Patent No. 6,351,326 B1) in view of Morse (U.S. Patent No. 6,876,050 B2). This rejection is respectfully traversed.

Claims 30, 34-35, 40, 42 and 46-47 are dependent claims that are believed allowable at least for the same reasons as the claims from which they depend. Independent claim 48 recites the same features in claim 25 that distinguish from Morse et al. Morse is not cited as providing such missing features. Therefore, claim 48 is believed allowable for at least the same reasons as claim 25.

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CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (612) 373-6972 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this ____ day of November 2008.

Name

Signature